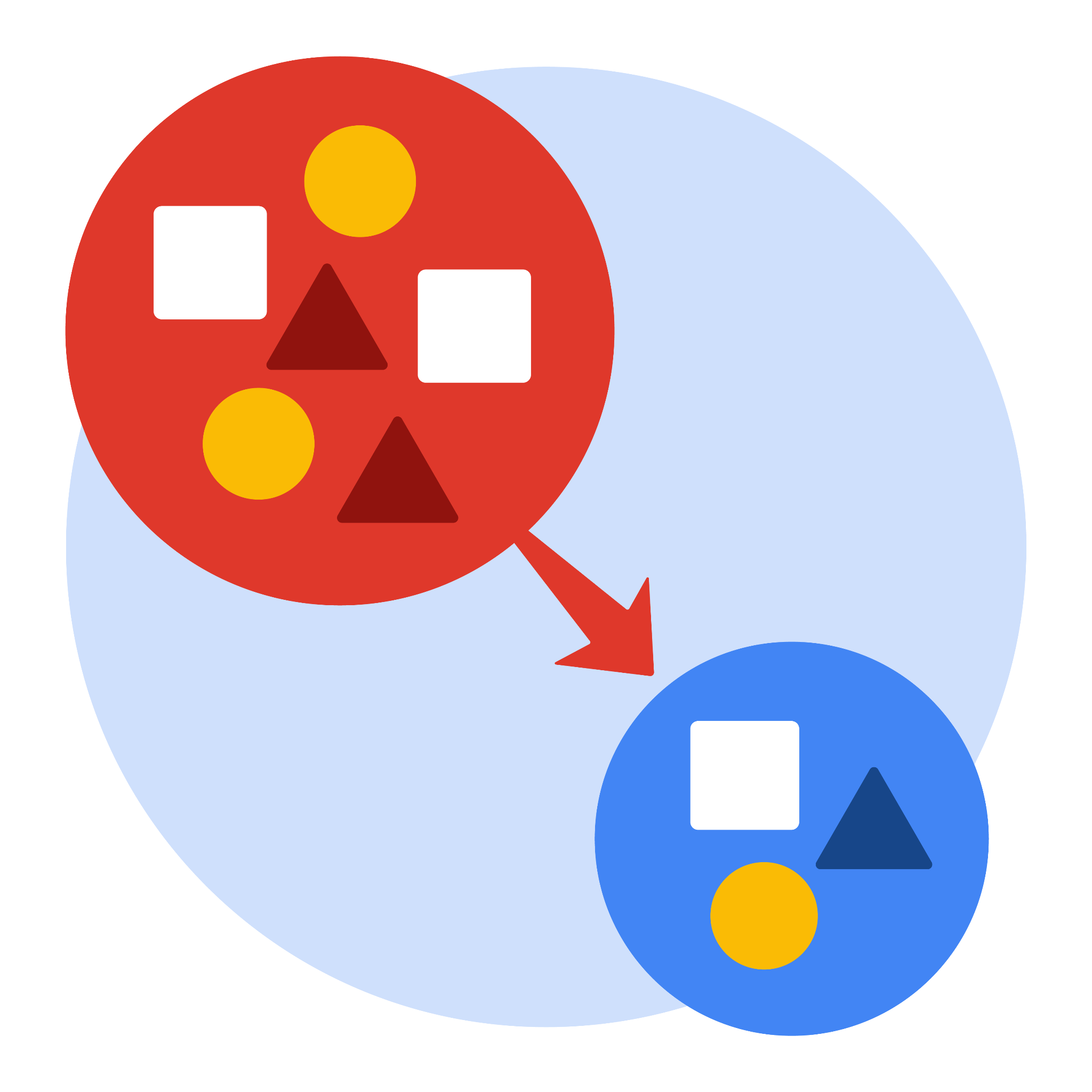
**Course Four**

# From Data to Insight: The Power of Statistics



# Instructions

Use this PACE strategy document to record decisions and reflections as you work through this end-of-course project. As a reminder, this document is a resource that you can reference in the future, and a guide to help you consider responses and reflections posed at various points throughout projects.

# Course Project Recap

Regardless of which track you have chosen to complete, your goals for this project are:

* Complete the questions in the Course 4 PACE strategy document
* Answer the questions in the Jupyter notebook project file
* Compute descriptive statistics
* Conduct a hypothesis test
* Create an executive summary for external stakeholders

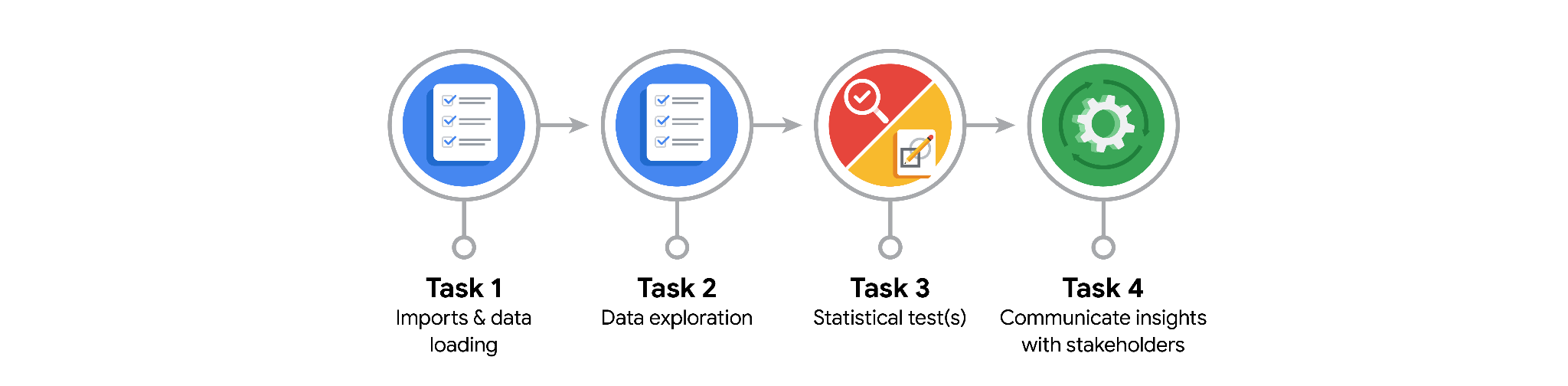
# Relevant Interview Questions

Completing this end-of-course project will empower you to respond to the following interview topics:

* How would you explain an A/B test to stakeholders who may not be familiar with analytics?
* If you had access to company performance data, what statistical tests might be useful to help understand performance?
* What considerations would you think about when presenting results to make sure they have an impact or have achieved the desired results?
* What are some effective ways to communicate statistical concepts/methods to a non-technical audience?
* In your own words, explain the factors that go into an experimental design for designs such as A/B tests.

**Reference Guide**

This project has four tasks; the visual below identifies how the stages of PACE are incorporated across those tasks.



**Data Project Questions & Considerations**

**PACE: Plan Stage**

* What is the main purpose of this project?

The main purpose of this project is to determine whether there is a statistically significant difference in the average number of drives between Android and iPhone users.

* What is your research question for this project?

Is there a statistically significant difference in the average number of drives between Android and iPhone users of the Waze application?

* What is the importance of random sampling?

Random sampling is important because it ensures that the sample represents the overall population fairly, reducing bias and allowing the results to be generalized confidently to the entire user base.

* Give an example of sampling bias that might occur if you didn’t use random sampling.

If you only select Waze users from a specific city or region, the sample may not reflect the driving behavior of users nationwide. This could lead to biased results that don’t accurately represent the average number of drives for all Android and iPhone users.



 **PACE: Analyze & Construct Stages**

* In general, why are descriptive statistics useful?

Descriptive statistics summarize and organize data, making it easier to understand key characteristics like the average, spread, and patterns within the dataset before conducting further analysis.

* How did computing descriptive statistics help you analyze your data?

Computing descriptive statistics helped by revealing the average number of drives, variability, and distribution for both Android and iPhone users, which provided a clear overview of the data and informed the next steps in hypothesis testing.

* In hypothesis testing, what is the difference between the null hypothesis and the alternative hypothesis?

The **null hypothesis (H₀)** assumes there is no effect or difference—in this case, that the mean number of drives is the same for Android and iPhone users. The **alternative hypothesis (H₁)** suggests that there is a difference in the mean number of drives between the two groups.

* How did you formulate your null hypothesis and alternative hypothesis?

I formulated the null hypothesis to state that there is no difference in the average number of drives between Android and iPhone users (H₀: mean drives are equal). The alternative hypothesis states that there is a difference in the average number of drives between the two groups (H₁: mean drives are not equal).

* What conclusion can be drawn from the hypothesis test?

On conducting the hypothesis test, the results indicated that there is no statistical difference between the mean number of drives of iPhone and Android users, as the p-value was greater than the significance level.

**PACE: Execute Stage**

* What key business or organizational insight(s) emerged from your A/B test?

The test revealed that device type (iPhone vs. Android) does not significantly impact the average number of drives. This suggests that user engagement, in terms of driving frequency, is consistent across device types. Therefore, Waze can focus marketing and feature strategies on factors other than device type to improve user retention and engagement.

* What recommendations do you propose based on your results?

Since there is no significant difference in driving behavior between iPhone and Android users, I recommend Waze focus on other factors influencing user engagement and churn, such as app features, user experience, or regional differences. Marketing and product strategies should target all users broadly rather than tailoring specifically by device type. Additionally, further analysis could explore other variables that might impact user behavior.